

WestminsterResearch

<http://www.westminster.ac.uk/westminsterresearch>

The paradox of competition for airline passengers with reduced mobility (PRM)

Ancell, D.

This is a copy of the final version of an article published in the Journal of Air Transport Studies, volume 7 (1) pp. 111-129, Winter 2016. It is available from the publisher at:

http://etem.aegean.gr/files/JATS_V7I12.pdf

The WestminsterResearch online digital archive at the University of Westminster aims to make the research output of the University available to a wider audience. Copyright and Moral Rights remain with the authors and/or copyright owners.

Whilst further distribution of specific materials from within this archive is forbidden, you may freely distribute the URL of WestminsterResearch: (<http://westminsterresearch.wmin.ac.uk/>).

In case of abuse or copyright appearing without permission e-mail repository@westminster.ac.uk

Journal of 
**Air Transport
Studies**

Volume 7-No1
Winter 2016



The *Journal of Air Transport Studies* (JATS – ISSN: 1791-6771) is a peer reviewed journal aiming at publishing high quality research related to air transport. JATS is interested in publishing papers primarily focusing on economics, geography, policymaking, management, marketing, operations, technology, logistics/supply chain management and modelling.

The Journal is published electronically twice a year, i.e. in January and July by the Hellenic Aviation Society (www.aviationsociety.gr). The Winter issue usually contains papers (subject to changes) originally presented at the Air Transport Research Society (www.atrsworld.org) Conference of the previous year(s) whereas the Summer issue may be occasionally dedicated to a special theme. The Journal is accessible online free-of-charge.

Journal of Air Transport Studies (JATS)

© Hellenic Aviation Society

12, Agiou Charalambous Street, Athens 114 74, Greece.

Telephone: +30 210 64 24 401

Facsimile: +30 210 64 24 401

Website: <http://www.aviationsociety.gr>

Volume 7, Number 1, Winter 2016, ISSN: 1791-6771.

Editorial and Advisory Board

- Editor-in-Chief: Professor Andreas Papatheodorou, Hellenic Aviation Society and University of West London, United Kingdom
- Associate Editors:
 - Dr Kostas Iatrou, Hellenic Aviation Society, Greece
 - Dr Antigoni Lykotrafiti, University of West London, United Kingdom
- Assistant Editors:
 - Dr Dimitrios Stergiou, Hellenic Open University, Greece
 - Dr Zheng Lei, University of Surrey, United Kingdom

- Chief Editorial Officer: Ms Marina Efthymiou, University of West London, United Kingdom.
- Book Reviews Officer: Dr Pavlos Arvanitis, Southampton Solent University, UK
- Conference Reports Officer: Ms Iouliia Poulaki, University of the Aegean, Greece

- Honorary Advisor: Dr Taieb Cherif, Former ICAO Secretary General

- Scientific and Advisory Board
 - Professor Evangelos Christou, Technological Institute of Thessaloniki, Greece
 - Professor Larry Dwyer, University of New South Wales, Australia
 - Professor Peter Forsyth, Monash University, Australia
 - Professor Sveinn Gudmundsson, Toulouse Business School, France
 - Professor Hans-Martin Neimeier, University of Applied Sciences Bremen, Germany
 - Professor Tae Oum, President of ATRS, University of British Columbia, Canada
 - Professor Paris Tsartas, University of the Aegean, Greece
 - Professor Respicio Espírito Santo, Rio de Janeiro Federal University, Brazil
 - Professor Pauline Sheldon, University of Hawaii, USA
 - Professor Kerstin Wegener, Frankfurt University of Applied Sciences
 - Professor Anming Zhang, University of British Columbia, Canada
 - Professor Yvonne Ziegler, Frankfurt University of Applied Sciences, Germany
 - Dr Leonardo Corbo, LUISS Guido Carli University, Italy
 - Dr Anderson Correia, Instituto Tecnológico de Aeronáutica, Brazil
 - Dr Dimitrios Dimitriou, Dimocritus University, Greece
 - Dr Rafael Echevarne, ACI, Canada
 - Dr Triant Flouris, Hellenic American University, Greece
 - Dr Anne Graham, University of Westminster, United Kingdom
 - Dr Paul Hooper, Department of Transport, Abu Dhabi, UAE
 - Dr Panagiotis Karamanos, Athens International Airport, Greece
 - Dr Eleftherios Katarelos, Hellenic Civil Aviation Authority, Greece
 - Dr Tay Ryang Koo, University of New South Wales, Australia
 - Dr Konstantinos Kostopoulos, Hellenic Competition Commission, Greece
 - Dr Christos Markou, IATA, Canada
 - Dr Keith Mason, Cranfield University, United Kingdom
 - Dr Antonio Menezes, University of the Azores, Portugal
 - Dr John F. O'Connell, Cranfield University, United Kingdom
 - Dr Marianna Sigala, University of the Aegean, Greece
 - Dr Theodoros Stavrinoudis, University of the Aegean, Greece
 - Dr Bijan Vasigh, Embry-Riddle Aeronautical University, USA
 - Captain Spyros Jancovich, Hellenic Aviation Society, Greece
 - Mr Takis Adamidis, Hellenic Aviation Society, Greece
 - Mr Mario Diaz, Atlanta International Airport, USA
 - Mr Emmanuel Gyzis, Emm. A. Gyzis & Partners Law Offices, Greece
 - Mr Ray Kaduck, Canadian Transportation Agency, Canada
 - Mr Emmanuel Keramianakis, Hellenic Aviation Society
 - Mr Antonios Simigdalas, Elix Aviation Capital, Ireland
 - Ms Narjess Teyssier, ICAO, Montreal
 - Mr Stamatis Varsamos, Athens International Airport, Greece
 - Mr David Young, Eurocontrol, France

Notes for Contributors

JATS publishes the following categories of papers written in scholarly English: a) Full Research Papers, b) Conference Reports, c) Book Reviews, d) Industry Perspectives. Papers should be submitted electronically to andreas.papatheodorou@uwl.ac.uk in MS-Word format ONLY using British spelling, single-column, 1.5 line spacing, Tahoma letters, font size 11. Section headings (and sub-headings) should be numbered and written in capital letters. Upon acceptance of a paper and before its publication, the corresponding author will be asked to sign the *Transfer of Copyright* form on behalf of all identified authors.

Full Research Papers should contain original research not previously published elsewhere. They should normally be between 4,000 and 7,000 words although shorter or lengthier articles could be considered for publication if they are of merit. The first page of the papers should contain the title and the authors' affiliations, contact details and brief vitae (of about 50 words). Regarding the following pages, papers should generally have the following structure: a) title, abstract (of about 150 words) and six keywords, b) introduction, c) literature review, d) theoretical and/or empirical contribution, e) summary and conclusions, f) acknowledgements, g) references and h) appendices. Tables, figures and illustrations should be included within the text (not at the end), bear a title and be numbered consecutively. Regarding the referencing style, standard academic format should be consistently followed. Examples are given below:

- Airbus (2003), *Global Market Forecasts 2003-2022*, Toulouse: Airbus.
- Fragoudaki, A., Keramianakis, M. and Jancovich, S. (2005) The Greek PSO Experience. *4th International Forum on Air Transport in Remoter Regions*. Stockholm, May 24-26.
- Forsyth P. (2002a), 'Privatization and Regulation of Australian and New Zealand Airports', *Journal of Air Transport Management*, 8, 19-28.
- Papatheodorou, A. (2008) The Impact of Civil Aviation Regimes on Leisure Market. In Graham, A., Papatheodorou, A. and Forsyth, P. (ed) *Aviation and Tourism: Implications for Leisure Travel*, Aldershot: Ashgate, 49-57.
- Skycontrol (2007) *easyJet welcomes European Commission's decision to limit PSO abuse in Italy*. 23rd April. Available from: <http://www.skycontrol.net/airlines/easyjet-welcomes-european-commissions-decision-to-limit-psy-abuse-in-italy/> (accessed on 22/08/2008).

Conference Reports should be between 1,000 and 1,500 words. They should provide factual information (e.g. conference venue, details of the conference organizers), present the various programme sessions and summarize the key research findings.

Book Reviews should be between 1,000 and 1,500 words. They should provide factual information (e.g. book publisher, number of pages and ISBN, price on the publisher's website) and critically discuss the contents of a book mainly in terms of its strengths and weaknesses.

Industry Perspectives should be up to 1,000 words and provide a practitioner's point of view on contemporary developments in the air transport industry. Contributors should explicitly specify whether their views are espoused by their organization or not.

TABLE OF CONTENTS

EDITORIAL.....	viii
----------------	------

Chunyan Yu, Seock-Jin Hong

Full Research Papers

1. Trends in airport surface access in the London multi-airport system.....	1-28
---	------

Richard Moxon

The London multi-airport system is described and changes in ownership from state organisations to competing private enterprises are assessed. A taxonomy of United Kingdom government action related to airport planning policy is presented with critical analysis in relation to airport surface access strategy. Changes in public transport use by passengers and employees at London airports are quantified to illustrate the success or otherwise of government policy. Passenger groups (defined by nationality and trip purpose) driving the increase in public transport are identified. Current London airport surface access strategic targets for passengers and employees are compared with the early versions suggested by the government to highlight the changed airport approach. Emerging surface airport access issues at London's airports are discussed.

2. An Assessment of Disincentive Policy on Slot Allocation System in Indonesian Airports	29-48
--	-------

Danang Parikesit, Safriah, Yusa C. Permana

Indonesian airports have been experiencing significant air traffic growth and are unable to cope with the increasing air passenger demand. There is an urgent need for an effective slot allocation strategy to manage the demand for airport capacity. This paper conducts a case study to examine the possibility of managing slot time allocation to maximize runways capacity by analysing disincentive strategy in balancing the usage of runways with Capacity Restraint and Demand Balanced approach. The research found that airlines willing to use slot time at the most demanded time interval should pay an additional 6.57% (CR approach) from total revenue gained by the government from slot sector and 6.55% (DB approach). The additional cost for less demanded slot time interval is only 0.09% (in both CR and DB approaches). Findings from this study should be considered as an initial step toward educating policy makers and airport authorities with the aims to creating better mechanism in Indonesia's airspace market.

3. Demand estimation for a new air route.....	49-70
---	-------

Jong Hae Choi, Yong Wha Park, Sang-Yong Lee, Kwang Soo Lee

Network connectivity is core competitiveness of the aviation industry and opening a new route is one of critical ways to enhance network competitiveness. As many airport operators are becoming more interested in attracting airlines, there are vast needs to discuss the methods for estimating (predicting) potential demands for a new flight route or by increasing flight frequencies in existing routes. This study explores demand estimation models for a new air route. Similar to previous studies, this study classified potential demand for a new air route into four types (Local, Beyond, Behind and Bridge). Explanatory variables are identified and constructed for each type of demand, including distance, relative capacity compared with adjacent airports and detour ratio as main independent variables. One of the strengths of the suggested demand models can distinguish the generated demand from the converted or re-distributed demand. Based on this, the model is meaningful for an airport operator to develop an airport policy such as airport-usage charges and incentives to attract airlines. On the other hand, because of the strong recognition that demand estimation for a new air route is the area of airlines that decide on

whether or not to introduce a new route, simply developing demand estimation models from the perspective of an airport operator is not sufficient. Therefore this study is considered as the initial step for an airport operator in its efforts to attract airlines and market new air routes to enhance network connectivity of its airport.

4. Impact of timetable synchronization on hub connectivity of European carriers.....71-94

Adam Seredyński Tobias Grosche, Franz Rothlauf

This paper evaluates the net impact of timetable synchronization on the connectivity of the key European carriers at their main hubs. We measure hub connectivity using a weighted connectivity score (WCS) that takes into account the number and the trip time related quality of flight connections. Based on WCS, we compare hub performance resulting from the existing schedule against a random expectation calculated from multiple randomized schedule simulations. In each simulated schedule scenario we randomly vary the flight departure and arrival times within the operation hours at a hub and at outbound stations keeping all other flight parameters from the real schedule unchanged. We observe that the timetable synchronization leverages hub connectivity of most analyzed airlines by 40% to 60%. The highest increase of connectivity is achieved by medium-sized carriers that operate peaky wave systems with flights concentrated in many short and non-overlapping banks, as well as by carriers that organize their flights in directional waves. The lowest increase is achieved by airlines that operate at highly congested airports. At most hubs, connections to long-haul flights operated with wide-body aircraft are better synchronized than connections between short-haul flights.

5. Airline Fares: A Comparison Between Spanish and French Travel Agencies.....95-110

José-Luis Alfaro Navarro, María-Encarnación Andrés Martínez, Jean-François Trinquencoste

The existence of different types of intermediaries - e-tailers, traditional or offline retailers and multichannel retailers - engaged in the sale of airline tickets has enabled consumers to find different prices if they spend time searching for information. This has prompted internet marketing research to increasingly focus on the issue of pricing, analyzing the differences between these retailers with respects to price levels, price dispersion, pricing strategies, etc. Moreover, there are also studies examining the effects of culture on prices. However, there is no literature on the effects of the culture from the supplier point of view. This paper attempts to fill in the gap by studying whether the geographical locations of the travel agencies affect airline ticket prices. In particular, the study compares the price behavior of French and Spanish intermediaries operating exclusively online and those operating simultaneously in travel agencies and on the internet (offline and online). To this end, we consider three routes that connect Madrid, Paris and New York, with data starting four months prior to the departure date (December 16, 2013). The results show several differences in the price levels and price dispersion between intermediaries in relation to the type of retailer and their geographical locations.

6. The Paradox of Competition for Airline Passengers with Reduced Mobility (PRM)..111-129

Debbie Ancell

Airline competition with customer service as product differentiator has forced down costs, air fares and investor returns. Two passenger markets operate in aviation: (a) able-bodied passengers for whom airlines compete and (b) passengers with reduced mobility (PRMs) – disabled by age, obesity or medical problems – for whom airlines do not compete. Government interference in the market intended to protect a minority of narrowly-defined PRMs has had unintended consequences of enabling increasing numbers of more widely-defined PRMs to access complimentary airline provisions. With growing ageing and overweight populations and long-haul travelling medical tourists such regulation could lead to even lower investors' returns. The International Air Transport Association (IATA) (2013)

examined the air transport value chain for competitiveness using Porter's (2008) five forces but did not distinguish between able-bodied passengers and PRMs. Findings during an investigation of these two markets concurred with IATA-Porter that the markets for the bargaining powers of PRM buyers and PRM suppliers were highly competitive. However, in contrast to the IATA conclusions, intensity of competition, and threats from new entrants and substitute products for PRM travel were low. The conclusion is that airlines are strategically PRM defensive by omission. Paradoxically, the airline which delivers the best PRM customer service could become the least profitable.

Editorial

Selected papers from the 18th Air Transport Research Society World Conference, Bordeaux (France), 2014

Chunyan Yu

College of Business

Embry-Riddle Aeronautical University, United States

E-mail: Chunyan.yu@erau.edu

Seock-Jin Hong

University of North Texas, USA, and Kedge Business School, France

E-mail: Seock.Hong@unt.edu

seockjin.hong@kedgebs.com

The 18th Air Transport Research Society World Conference (ATRS) was held in Bordeaux, France, from July 17 to July 20, 2014. The conference attracted some 347 participants, and 321 papers were presented. The guest editors have selected six papers to be included in this special issue. These papers cover a wide range of topics presented and discussed at the conference and offer important contribution to the literature on air transport.

Surface access strategy is essential for the success of an airport. In the first paper, **Richard Moxon** investigates trends in airport surface access at the London area airports. The paper examines changes in public transport use passengers and employees at London airports in relation to government policy actions. The paper also identifies and discusses emerging surface airport access issues at the London airports.

Continuing with airport management strategies, **Parikesit, Safrilah, and Permana** present a case study of Sukarno-Hatta International Airport (Indonesia) in an attempt to explore effective airport slot allocation strategies to cope with the increasing pressure on airport capacity in the fast growing Indonesian aviation market. The paper argues that the existing slot allocation system does not consider market demand, and suggests that airport slots should be allocated through an auction system. Based on results from a simulation of slot market values, the study suggests that slot auction system can generate substantial revenues to maintain and operate the slot time management system, and encourages efficient distribution of aircraft departure time.

Moving from managing airport demand to air service development and network competitiveness, **Choi, Park, Lee and Lee** develop the models for estimating the demand for a potential new route from an airport. The proposed methodology is applied to Incheon International Airport, and the results indicate that distance, relative capacity and detour

ratio among other factors have significant effects on the demand for a potential new route. The demand model may also help an airport operator develop airport charge policy as well as incentive schemes to attract airlines.

Seredyński, Grosche, and Rothlauf examine the connectivity of airlines at their hub airports in terms of flight schedules. In particular, the paper evaluates the net impact of timetable synchronization on the connectivity of the key European carriers at their main hubs. The authors measure hub connectivity using a weighted connectivity score (WCS) that takes into account the number and the trip time related quality of flight connections. Their results indicate that the timetable synchronization leverages hub connectivity of most of the analyzed airlines by 40% to 60%. At most hubs, connections to long-haul flights operated with wide-body aircraft are better synchronized than connections between short-haul flights.

In the fifth paper, **Navarro, Martínez, and Trinqucoste** investigate whether the geographical locations of the travel agencies affect airline ticket prices. The study compares the price behavior of French and Spanish intermediaries operating exclusively online and those operating simultaneously in travel agencies and on the internet (offline and online). In particular, the study examines air fares on three routes that connect Madrid, Paris and New York, and their results indicate that there are indeed differences in the price levels and price dispersion between intermediaries with respect to the type of retailer and their geographical locations.

The last paper addresses a topic that has not received much attention in academic literature. **Ancell** examines government policies and regulations that are intended to protect passengers with reduce mobility (PRMs). However, these policies and regulations have led to the unintended consequences of enabling increasing numbers of more widely-defined PRMs to access complimentary service provisions, which could result in lower profitability for the airlines and their investors. The paper further reviews Porter's five forces of competitiveness as applied to the airline industry and test their validity for the PRM market.

We would like to extend our thanks to the authors and the reviewers for their contribution to this ATRS special issue of Journal of Air Transport Studies. We believe that these papers provide valuable contribution to our understanding of the airlines and airports and will encourage further research on the respective topics.

THE PARADOX OF COMPETITION FOR AIRLINE PASSENGERS WITH REDUCED MOBILITY (PRM)

Debbie Ancell¹

University of Westminster

ABSTRACT

Airline competition with customer service as product differentiator has forced down costs, air fares and investor returns. Two passenger markets operate in aviation: (a) able-bodied passengers for whom airlines compete and (b) passengers with reduced mobility (PRMs) – disabled by age, obesity or medical problems – for whom airlines do not compete. Government interference in the market intended to protect a minority of narrowly-defined PRMs has had unintended consequences of enabling increasing numbers of more widely-defined PRMs to access complimentary airline provisions. With growing ageing and overweight populations and long-haul travelling medical tourists such regulation could lead to even lower investors' returns. The International Air Transport Association (IATA) (2013) examined the air transport value chain for competitiveness using Porter's (2008) five forces but did not distinguish between able-bodied passengers and PRMs. Findings during an investigation of these two markets concurred with IATA-Porter that the markets for the bargaining powers of PRM buyers and PRM suppliers were highly competitive. However, in contrast to the IATA conclusions, intensity of competition, and threats from new entrants and substitute products for PRM travel were low. The conclusion is that airlines are strategically PRM defensive by omission. Paradoxically, the airline which delivers the best PRM customer service could become the least profitable.

Keywords: disabled passengers, costs, regulation, competitiveness.

¹ Debbie Ancell is part of the Faculty of Architecture and the Built Environment at the University of Westminster, London NW1 5LS

d.ancell@westminster.ac.uk

1. INTRODUCTION

Historically, airline profits have been very thin improving from 3.8% in 1996-2004 to 4.1% in 2004-2011 according to the International Air Transport Association (IATA) briefing on profitability and problems in the air transport value chain (IATA, 2013). Airline industry returns are not regarded as 'normal' for investors whose support is needed to keep pace with industry improvements. Net profit per passenger of \$US2.56 makes the industry vulnerable to rises in costs, taxes, demand and inefficiently designed regulations which affect the allocation of risk (*ibid*). Generally, airlines compete for passengers. However what is not recognised is that there are actually two passenger markets – one for able-bodied passengers and another for passengers with reduced mobility (PRMs). The composition of the PRM market has evolved from the lone wheelchair traveller to increasing numbers of mobility-impaired elderly, obese and medically incapacitated passengers who require airline assistance beyond that required by able-bodied passengers. PRMs often request discounts for their travel companions and for the additional seat sometimes needed for obese passengers. PRM service expectations can be extremely high. Chan and Chen's (2012) study of expectations of elderly travellers found their wants included "special services ... seat selection... exclusive Customs counter [and] priority boarding ... [furthermore] current air transport services do not meet their demands." (Chang and Chen, 2012: 27).

The International Air Transport Association (IATA) (2013) examined the air transport value chain for competitiveness using Porter's (2008) five forces but did not distinguish between able-bodied passengers and PRMs. The purpose of this paper is to review the five forces of competitiveness as assessed in Porter's airline industry competitiveness report (IATA, 2013) and test their validity for the PRM market.

2. GOVERNMENT AND AIRLINE PRIVATISATION

Many airlines were once owned and controlled by governments which starved them of the investment needed to grow and compete (Doganis, 2001). Doganis in his text on aviation evolution, noted that privatisation preparations should have included identification of "any explicit or hidden subsidies provided by government or government enterprises... [and]...since the airline will no longer receive direct or hidden subsidies it should not be required to undertake any non-commercial activities ... any obligations placed upon the airline which impose a loss should ideally be paid for by central or local government." (Doganis: 2001:196-7). At the time of privatisations many people relied on state subsidies for financial and social support. This financial assistance would eventually continue from many newly-privatised industries – but not for airlines. State aid to airlines should have been "considered as partial or even full compensation for past or present costs and penalties

imposed on state airlines by government actions.” (Doganis, 2001: 203). “As recently as the 1980s, the flag carriers were habitually regarded, and often regarded themselves, as having as their primary function the fulfilment of some public need ... an aim that had little to do with their own business. They were often perceived as a mere extension of a state service.” (Kangis and O’Reilly, 2003: 105). This philosophy has subsequently been absorbed into social and human rights legislation.

3. GOVERNMENT REGULATION, PRM AND AIRLINES

Within the European Union (EU), governments wanted to ensure that after privatisation the airlines continued with social obligations. Article 2(a) of EU Regulation (EC) No 1107/2006 states:

“Disabled person” or “person with reduced mobility” means any person whose mobility when using transport is reduced due to any physical disability (sensory or locomotor, permanent or temporary), intellectual disability or impairment, or any other cause of disability, or age, and whose situation needs appropriate attention and the adaptation to his or her particular needs of the service made available to all passengers.” (EU, 2006). Disability has now evolved into a social and economic issue instead of a medical issue. In the United Kingdom (UK) for example wheelchair users comprise less than 8% of the total population (Papworth Trust, 2012) and the ‘disabled person’ definition has been widened to include the increasing numbers of people with the disabilities of ageing, obesity and medical problems.

In the UK and in other jurisdictions, disability regulation provides for complimentary cargo space for medical equipment and up to two mobility aids per PRM (Civil Aviation Authority (CAA), 2010: 12) “subject to advance warning of 48 hours and to possible limitations of space on board the [small] aircraft, and subject to the application of relevant legislation concerning dangerous goods.” (CAA, 2012: 4). Airlines are not allowed to limit the number of disabled passenger or mobility devices on larger aircraft. Some of these mobility aids (e.g. electric mobility scooters) can weigh up to 175kg (almost twice the 100kg standard airline weight for passenger and luggage combined (CAA, 2010)) and absorb two cubic meters of revenue-earning cargo space. Darcy (2007) in his survey of disabled passenger needs noted that one couple had a disabled person’s hoist, a commode, two portable ramps, two wheelchairs and back pillows all of which would have consumed complimentary space and weight. In 2014, according to the British Healthcare Trade Association (BHTA) (the body representing assistive technology organisations), there are an estimated 300,000 mobility scooters in use in the UK (a 230,000 increase in five years). However, these devices are increasingly being used by the elderly and obese and consequently, whether the person is qualified disabled or not, they are entitled to free air freight if they self-declare to be a PRM. Unlike the issue of disabled

parking permits in the UK (of which 2.58 million are issued mostly for older people) (Department of Transport, 2013), PRMs are not required to provide proof of disability in order to access the complimentary services with quicker access through security on departure and clearance through Customs and Immigration on arrival. One in four Britons believed disabled people often overstated the level of their physical disabilities (Papworth Trust, 2012) which is consistent with observed PRM service abuse (Gatwick Airport, 2009; Airport Operators Association (AOA) 2009). There is currently no process to record the matching of genuinely disabled PRMs with the services required and therefore actual cost per PRM is unknown.

Cambridge Economic Policy Associates (2010:24) in a report for the UK Department for Transport noted that “the provisions regarding passengers with reduced mobility suggest that policy makers have taken a view that airlines operating in a competitive market would not make adequate provision for such passengers.” This is an acknowledgement that there are two types of passengers – one for which there is a market and another which needs regulation to ensure its functioning – and that there are additional costs involved. However, unlike UK ground transport, there was no provision for subsidy of any of the extra airline services, facilities and freight required.

4. AIRLINE COMPETITION

One characteristic of State-owned industry is that true competition is largely absent (Kangis and O'Reilly, 2003) and once freed from government control, airlines had to compete in a global marketplace. In general, State aid is no longer permitted within the EU however as an example UK railways receive subsidies from the State and registered disabled people and pensioners receive free, subsidised or discounted fares on railways and buses which are not available for airline travel. The International Transport Forum (ITF) report on mobility rights, obligations and equity in an ageing society (ITF, 2011) challenged whether these policies can continue with an annual cost of €1.19 billion for free ground travel to citizens aged over 60 and disabled people. It notes that “the ‘right’ to accessible public transport ... cannot be achieved without imposing obligations on those responsible for transport delivery” (*ibid*: 5).

The airline market is complicated. Before aviation deregulation and liberalisation around the mid-1980s onwards, many suppliers of air services such as airports and ground handling were also government-owned and often subsidised (Doganis, 2001). This meant that international airlines began to face the same problems as other globalising industries with marketplace pressures, requirements for product differentiation and the need to reduce unit costs to maintain competitiveness (Oum and Yu, 1998). The arrival of low-cost, low-fare carriers created an additional challenge for the established, legacy carriers with their higher overheads and historic

government influence. When demand falls, airlines cut their prices and capacity which is not always reflected in parts of the supply chain where, as an example and counter-cyclically, "airports raise charges to recover fixed costs when demand falls [causing a rise in airline costs] which accentuates the decline in airline returns. Airports have transferred volume risk onto airlines and ...yet airlines are probably the least able in the air transport supply chain to be able to bear this risk." (IATA, 2013: 27). High airport costs are reflected in airline fares which can dent airline competitiveness and profitability.

In a perfect market, demand from consumers for a homogenous product at an agreed price is met by the output of suppliers maximising their profits. There are few barriers to entry and exit. However, in aviation competition is never perfect because it is influenced by government policies. While acknowledging that economic regulation is still necessary where competition is insufficient IATA notes that "market forces are starting to have an influence in some sectors, but in most these forces are either inadequate or absent." (IATA, 2013: 41). Competing airlines with differentiated products are keen to attract customers from rivals and in the long run, the reduction in barriers has attracted new entrants with lower costs and lower fares.

Hong (2009) in his assessment of global competitiveness measurement for tourism noted that a single performance criterion – financial profitability – was insufficient for determining the competitiveness of an industry. In aviation, there are other criteria including the accident rate, customer service complaints and productivity of labour (Doganis, 2001). Abeyratne (2001) in his discussion of ethical and moral considerations of airline management widened the criteria to include productivity of revenue and capital as well noting that "when economic theory relating to competitiveness is blended with social justice, which is the human element of commercial aviation practice, the picture can become somewhat more murky from a competition perspective... [and yet] ...competitiveness is a critical driver of successful industry." (*ibid.*: 348). Social justice is not necessarily a corporate aim however it is often a government aim which is why safeguards were placed into many privatising parastatals. "The future cost of air transport thus has important implications for social and spatial equity...[and] the transformation of many people's desire for air travel into a consumer expectation, a norm, or even a 'right'." (Shaw and Thomas, 2006:209).

5. PRM AIRLINE COSTS

Poria *et al.*, (2009) in their exploratory study of the flight experiences of disabled people inventoried some of the additional equipment which would make flying easier for PRMs. In addition to lifting armrests which enable easier transfers into and out of seats, these included first aid accessories, accessible lavatories, on board wheelchair, spacious sitting space and "if possible, upgrades to business class" (*ibid.*: 224). In addition to these facilities, there is the opportunity cost of freight space in the hold, additional fuel to carry extra weights and the possibility of having to schedule an extra crew member or two to assist with the increasing numbers of elderly and obese passengers – particularly in the event of an evacuation.

While airport costs are fully reimbursed and airports can claim tax deductions for capital improvements, airlines do not get reimbursed for the additional costs of carrying PRMs. The on-board costs have to be covered in general ticket prices which are under pressure because of competing forces from low-cost carriers and carriers operating from low-cost countries. With thin profits per seat, rising fuel costs and likelihood of charges for CO₂ emissions, airlines are facing squeezed margins while maintaining competitiveness and fulfilling the legislated requirements. This leaves the airlines facing a growing volume of increasingly ageing, obese and medical PRMs without state subsidies but with legislated unrecoverable costs.

6. PRM MARKET

Worldwide, the PRM market is growing. In the UK estimates of the size and type of disabilities in the PRM travel market vary. According to the UK ODI (2012) there are 11 million disabled people in the UK of whom 5.3 million are over the state pension age and are disabled. The most common impairments for disabled adults of state pension age are mobility based (Papworth Trust, 2012; Chang and Chen, 2012; Lipp and van Horn, 2013) and the higher the level of mobility impairment the more expensive the air travel enabling processes. There are also 19 million people aged 60+ who are forecast to rise to 22.5 million by 2020 (UK ODI, 2012). In 2009, according to the UK CAA (2010) Heathrow (UK's largest airport) processed 650,000 PRMs annually (0.95% of total passengers); Gatwick Airport 324,000 PRMs (0.93%) and Manchester 181,000 (0.84%). Similarly, in the United States (US) – wheelchair assists from 2002 to 2011 increased over 13% each year (Lipp and van Horn, 2013) with just one airline alone at Newark averaging 35,000 per month most of which were for elderly travellers who needed help to cover the long distances to the gate, avoid waiting in lines or navigate the airport without assistance (*ibid.*). The same survey notes that the use of mobility aids is rising faster than wheelchair use. These findings were supported by Chang and Chen's (2012) Taiwan survey of 203 travellers over 65 years of age which found that elderly passengers had

difficulties with vision, hearing, cognitive capabilities, physical strength and the ability to walk long distances in the terminal – all of which could give them access to the regulated, specialised individual assistance required from the airline, increased luggage allowance and status recognition. These provisions are usually available to passengers who pay higher ticket prices for differentiated services.

Obese passengers pose challenges for airlines. The World Health Organisation (WHO) (2013) estimated that “more than 1.4 billion adults were overweight in 2008 and more than half a billion obese.” Furthermore, this number has been estimated to have doubled between 1980 and 2008 (*ibid*). Unlike passengers, the airline industry is silent on obesity (Small and Harris, 2011) as it is regarded as a sensitive issue. However, these passengers often need higher-priced or extra seats providing extra width and leg room. Airlines have varying charging policies for obese passengers who must be able to sit in the seat for which they have paid with both armrests down. Some carriers require the purchase of a second seat and others offer it at a discounted fare.

Medical tourists are another evolving group projected to increase particularly to long haul destinations (including India for cardiology, bariatric surgery and hip replacement and Pakistan for organ transplantation) (Lunt *et al.*, 2013; Gan and Frederick, 2013). Any medical condition can pose on-board service challenges as well as the risk of additional costs from medical emergency aircraft diversions which are not reimbursed by the PRMs. In a study (Hung *et al.*, 2013) of medical diversions of one Hong Kong carrier over five years researchers found that the most common diversion cause was suspected strokes, followed by chest pains and deaths – conditions common to ageing, obese or medical passengers.

The PRM statistics quoted do not separate the elderly, obese or medical tourists – only those who needed airport assistance – and do not state how many were accompanied by mobility aids or medical equipment carried free of charge. Statistically and erroneously PRMs are counted homogeneously. The US-based Open Doors Organisation (ODO) (2007) study of a survey of 1,032 American adults with disabilities noted that “Air travellers say they would take 2 more flights per year if airlines were to accommodate their needs as a person with a disability. This translates into 18.8 million more flights and means that air spending by the disability community could more than double if airlines were to make necessary accommodations.” (*ibid*). In a competitive market, the prospect of 18.8 million more passengers would normally encourage new industry entrants and increase competition among incumbents.

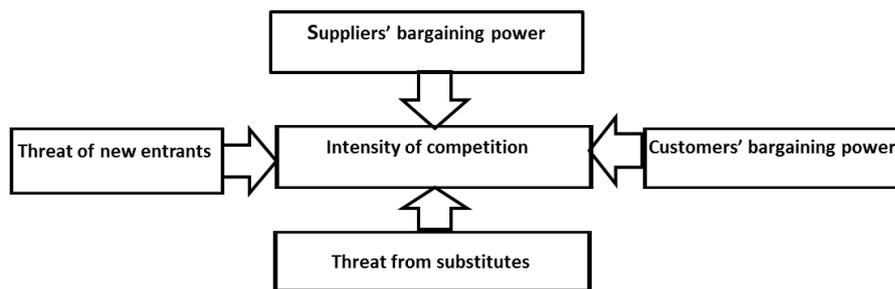
7. PRM MARKET VALUE

Disabled people's day-to-day living costs – for basic requirements such as mobility aids, care and transport – are 25% higher than those of non-disabled people (Papworth Trust, 2012). Estimates of PRM spending power vary and in the UK it is estimated at around £80 billion per year (Papworth Trust, 2012; Office for Disability Issues (ODI), 2012). In the US there are now estimated to be 54 million Americans with disabilities with an estimated spending power of \$220 billion (Business Disability Forum, 2014). According to Lipp and van Horn (2007) in their report of a quantitative survey to identify the travel habits of US adults with disabilities the US PRM airline market has the potential for an additional \$4 billion of PRM spend. However, this optimism conflicts with the often stated facts that people with disabilities are twice as likely to be in poverty as non-disabled adults (Papworth Trust, 2012). On the other hand the newly-retired often have considerable pension spending power although those over 65 years are more price-sensitive (Gan and Frederick, 2013).

8. PORTER'S COMPETITIVE FIVE FORCES

According to Porter (2008), the underlying economic and technological characteristics of an industry determine the strength of the five basic competitive forces which can help gauge its attractiveness and profit potential (Figure 1). They are: threat from new entrants and the difficulty accessing the market, bargaining power of suppliers and buyers to determine which party has the upper hand, the threat from substitute products which could undermine an industry by affecting the price and finally rivalry between existing competitors as a means of assessing the competitiveness intensity of the industry (Porter, 1980). The forces are graded, high, medium or low according to the force they exert on the industry. Two approaches are available: offensive (where the organisation tries to influence the balance of existing forces or exploit a change in the competitive balance before rivals recognise it) or defensive (where its capabilities provide the best defence against the competitive forces (*ibid*)). However, governments also influence an industry's structure and rivalry with policies which impact on a firm's strategy through market regulation, tax regime and anti-trust laws (*ibid*).

Figure 1: five forces of competitiveness



Source: Adapted and reprinted with permission from "The Five Competitive Forces That Shape Strategy" by Michael E. Porter. Harvard Business Review, Jan 01, 2008. Copyright 2008; all rights reserved.

9. AIRLINES, PORTER AND COMPETITIVENESS

In 2013 IATA hired expert Michael Porter to report on profitability and the air transport value chain which included an examination of competitiveness of the airline sector using his five forces on a homogenous passenger market. The forces were individually ranked as high, medium or low depending on their competitive influence. IATA-Porter's findings have been used as the basis for secondary research in this study.

10. FINDINGS

10.1 Threat from new entrants

The IATA-Porter report (2013) noted that the threat of new entrants in aviation is 'high' with only limited incumbency advantages for existing carriers. New entrants to any industry have to consider the incumbents' reaction in order to retain and enlarge their customer base. They signal their willingness to compete by advertising.

Despite the attractiveness of a potential market of 18.8 million more passengers (ODO, 2007) no airline advertising campaign has yet signalled the airlines' willingness to compete for PRMs nor advertised legislated service improvements and supporting products (e.g. on board wheelchair or lifting armrests). Furthermore, the removal of industry barriers and arrival of low-cost low-fare carriers has not sparked a price war for PRMs.

The changing market has changing costs. Flights comprising a mix of able-bodied passengers and PRMs could require extra crew members for safe evacuation and customer service as well as more on-ground services the cost of which would further reduce airline revenues unless ticket prices were increased. If more PRMs travelled with the airline offering the best customer service, that airline

would carry disproportionately high costs. Increasing fares to cover these costs would make the airline uncompetitive. Low-cost low-fare carriers would therefore be unlikely to chase this market and by increasing the number of seats per aircraft (thereby squeezing space) they could actively discourage mobility impaired PRMs.

On the other hand, if flights were to comprise only PRMs and their attendants then the threat of new airline entrants to the incumbents could only come from airlines which specialised in PRM travel. There would be few economies of scale available and with unequal access to distribution channels and high overheads from such a specialised service their prices would be higher and uncompetitive. Economies of scale are available as a means of lowering costs by using more information technology for ticketing, booking, check-in and boarding. However the PRMs are a group which requires the more individualised services and facilities usually offered by premium brands as product differentiation for enhanced ticket prices. There are no economies of scale in airline support for PRMs since each must be treated as an individual. Porter (2008) discussed the supply side economies of scale for production of larger volumes and the demand-side benefits of scale whereby "buyers may trust larger companies more for a crucial product." (*ibid.*: 26). PRMs may trust a larger airline with an established reputation, higher costs and fares rather than a low-cost carrier unless the passengers are income-constrained in which case they may have reduced choice (Nimrod and Rotem, 2012). Because of the foregoing cost implications and in contrast to the IATA rating of 'high', the threat from new entrants for the PRM market is judged low.

10.2 Bargaining power of PRM suppliers

The main airline suppliers for PRM services are the airport, ground handlers and fuel companies. Porter (2008) noted that powerful suppliers capture more of the value for themselves by charging higher prices, limiting quality or services or shifting costs to industry participants. IATA-Porter (2013) noted that airport services including handling were "more concentrated and consolidation has taken place leaving 3-5 major international companies" (IATA: 2013:34). In the UK two PRM ground handlers serve the top six airports.

Encouragement from the UK Government (ODI, 2012) outlines opportunities for businesses to access the disabled peoples' 'market'. Airline PRM suppliers include airports as well as manufacturers of on-board wheelchairs, airport mobility buggies, ambulift vehicles for lifting immobile passengers and providers of PRMs' services. To cover the costs of UK PRM ground handling, a charge is levied on each departing passenger ticket (IATA, 2013). The ground handling companies and the airports that rent them space and provide utilities are entitled to profit from supplying these services. IATA (2013) noted that ground handling faced the lowest volatility on

returns and that “returns are more volatile in the services sector, but there is little sign of these suppliers bearing much of the risk of the ups and downs of the air transport cycle.” (*ibid.* 27). Since the ground handlers are fully reimbursed, and the airlines do not negotiate directly with them, the bargaining power of these suppliers is high.

Fuel is another supply impacted by PRM needs. PRMs with heavy mobility scooters (and other aids) or an obese passenger (with or without mobility aids) require more fuel to transport them than a passenger of standard weight with baggage (100kg). The additional weights affect global competitiveness because some carriers have lower fuel prices and operating costs than others. Emissions trading companies profit because of the additional emissions produced from the extra weight. While airlines cannot levy extra charges for PRMs’ needs, the fuel companies are able to charge for all the fuel needed irrespective of how it is used. Their bargaining power is also high because airlines are captive to the airport, the PRM contractors and the fuel companies the bargaining power of airline PRM suppliers is high which accords with IATA’s general findings.

10.3 Bargaining power of PRMs as buyers

Airline tickets are a price sensitive purchase absorbing a considerable share of discretionary spending. Air travel is mostly a standardised product which is contrary to what many PRMs need. In a normal market powerful customers can capture more value by forcing down prices, demanding better quality or more service and playing industry participants off against one another all at the expense of industry profitability (Porter, 2008). However, the PRM market is not normal.

PRMs have the protection of regulation to enable their equal treatment without meeting the cost of any negative externalities (i.e. costs not fully counted in the ticket price). The concept of PRM travel as a “right” to access social justice (Abeyratne, 2001) places the costs of negative externalities with the airline. Any attempt to charge PRMs for their extra services or freight would be against many Regulations in multiple jurisdictions. Furthermore, “Any state intervention to internalise the adverse externalities will raise fares and reduce availability to lower income groups” (Shaw and Thomas, 2006:209). This would impact on any PRMs already faced with 25% higher living costs, lower incomes and declining health, factors of ageing which were noted by Nimrod and Rotem (2012) in their study of successful ageing among older tourists. Indeed disability writers and researchers Lipp and van Horn (2013) indicate that “airlines risk being overwhelmed by the coming ‘silver tsunami’” (*ibid.* 2).

In agreement with IATA, the bargaining power of PRMs as buyers is ‘high and fragmented’ because of legislated protection.

10.4 Threat from substitutes

A substitute performs the same or similar function as a product by a different means for example video conferencing for travel (Porter, 2008) and with the increasing arrangement of technological travel substitutes some PRMs may swap actual for virtual travel. However, much depends on the motive for the journey – whether for relaxation, visiting friends and relations, business or to save time – and also on the PRM's disability. Elderly people may have time to spare and desire for new experiences (Fleischer and Pizam, 2002) in which case virtual cannot compete with actual for the experience. If the PRM was seeking medical treatment then time may be of the essence. Short haul PRMs often have the alternative of travelling by car or ship, or by subsidised bus or train. However long haul journeys have reduced choice – airplane or boat. For these reasons and in contrast to IATA, the threat to aviation from competitive substitution in the PRM market is low whereas IATA found the threat to be 'medium and rising' for the mainstream passenger market.

10.5 Intensity of competition

According to Porter (2008) rivalry can take many forms including discounting prices, developing new products, advertising campaigns and improving services. Rivalry often intensifies over time but it can be destructive to profitability if it is reliant solely on price because "price competition transfers profits directly from an industry to its customers. Price cuts are usually easy for competitors to match making successive rounds of retaliation likely" (*ibid.*: 32). If industry price cutting is continual customers who focus on price usually pay less attention to the product and services (Porter, 2008) until something goes adrift. PRMs need a certain level of service for comfort (Lipp and van Horn, 2013). Customer service complaints are one measure of industry competitiveness. In the US PRM customer service complaints in 2006 rose with most complaints related to failure to provide adequate assistance to persons with wheelchairs (US Department of Transportation, 2006) and damage to wheelchairs.

In alignment with new market entrants, incumbent airlines are not exhibiting the Porter characteristic of chasing competition for PRMs. Rivalry among airline competitors for the PRM market would be considered 'low' in contrast to IATA which ranked rivalry for all passengers as 'high'.

11. DISCUSSION

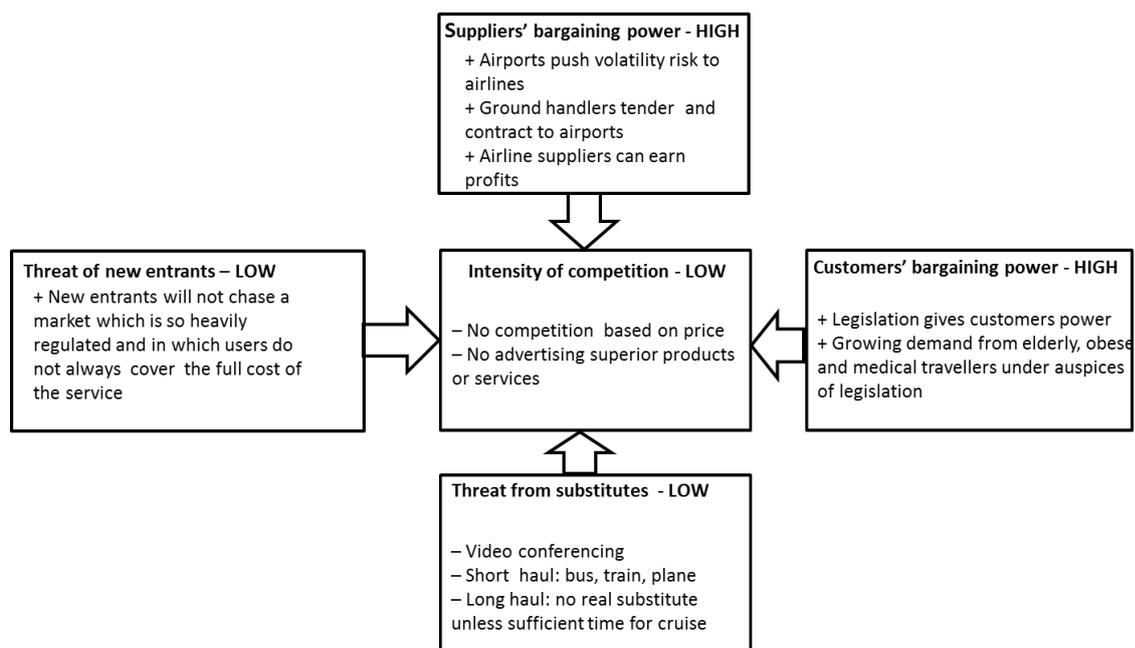
The IATA (2013) report fails to acknowledge the existence of two passenger markets and within the PRM market, the potential for increasing costs imposed on the airlines from growing numbers of elderly, obese and medical travellers with heavy mobility aids.

Airlines are not competing for PRMs although PRMs are a considerable and growing market. The threat from new entrants, substitute products and rivalry are actually 'low' rather than 'medium' or 'high' as IATA found (Table 1).

Table 1: comparison of IATA industry rating and PRMs' market using Porter's five forces of competitiveness

FORCE	INDUSTRY COMPETITIVENESS RATING (IATA, 2013)	PRM MARKET COMPETITIVENESS RATING
Threat of new entrants	High	Low
PRM suppliers' bargaining power	High	High
PRM buyers' bargaining power	High	High
Threat from substitutes	Medium and rising	Low
Intensity of competition	High	Low

Figure 2: Porter's five forces model of airline industry competition adapted for PRM market



The bargaining powers of buyers and suppliers for PRMs accord with the IATA findings i.e. 'high' (Figure 2). Porter's five forces are an appropriate lens with which to examine the PRM airline market (Figure 2).

Porter (2008) says that companies must find a position in their industry where the competitive forces will do them the most good or the least harm. Reshaping the forces as Porter recommends would not assist either airline costs or revenues as long as regulation skews the marketplace. Porter's recommended offensive strategies advised neutralising supplier power, expanding services to counter competitor power, tempering price wars, increasing costs of competing to scare new entrants and limiting the threat of substitutes by offering better value. These are inappropriate given the increasing numbers of passengers claiming mobility impairment and the unknown quantities, space and weight of accompanying aids and medical equipment as well as the inability of airlines to charge for the additional services and freight.

Ticket prices differentiate passengers. They pay more for features such as personalised customer service, extra luggage allowance, wider seats and more leg room. This is available in the higher priced cabins for which higher fares are paid. However, these features are what many PRMs require without additional charges. According to ODO (2012), the top features or services that airlines would need to offer to encourage more frequent PRM travel include: "1) more accommodating staff, 2) guaranteed preferred seating, and 3) a designated employee at check-in and arrival" (*ibid*) all of which take the PRM out of the mainstream where the efficiencies lie. Social justice is not being served by making one passenger group (higher fares, more space and differentiated enhanced services) pay for what another group (PRMs) acquires free of charge. In the lean principle, customers should only receive those services for which they are willing to pay however there are disabled PRMs with high dependency on non-rechargeable added-value items who would probably never be able to afford to fly if the full price of their travel was charged. The ITF (2011) raised the question of which body is responsible for the costs on land transport (the state or local governments) but that issue has not been raised for airlines.

Governments have recognised that PRMs need protection and regulated accordingly however, one of the unintended consequences places the additional costs of carrying PRMs onto the airlines without any compensating subsidies. There are hidden costs including opportunity costs of increased numbers of PRMs as well as adding to the turnaround times for low-cost, low-fare carriers, scheduling extra crew members to assist with any on board service or emergency evacuation or leaving behind perishable cargos or other passengers' luggage to accommodate PRMs' mobility aids. The growth in the sales of personal electric mobility scooters – which a self-declared PRM can

demand be transported free of charge – also has the potential to further reduce airline revenues. The ITF (2011) report raised the question of whether a 'right' to transport confers priority over other passengers. Bhatta (2013) in his examination of pay-as-you-weigh pricing of an air ticket noted that "an airline cannot provide travel service if it is not able to make profits by providing that service" (*ibid.*: 107). In the past 40 years the airline industry has more than halved the cost of air transport in real terms with improvements in fuel efficiency, asset use and productivity of labour, capital and revenue only to realise that "these efficiency gains have ended up in lower air transport costs [and customer fares] rather than improved investor returns" (IATA, 2013: 41).

No other disabled-persons' supply industry has had regulated market impediments. The airline industry's focus on reducing costs has not fed through to improved returns for investors for many reasons including the foregoing hidden costs. With the increasing disabling of the population through ageing, obesity and medical conditions, it is predictable that more PRMs will become disabled in the context of air travel and take advantage of additional, complimentary services and allowances without proof of genuine need.

The profitability criteria on which successful airlines are judged by investors is too narrow for PRMs' airline choice – "...over a third of disabled people said that good disability service was the primary reason for choosing a provider or product. Two thirds choose businesses where they have received good customer service related to their disability. Companies that tell disabled people about the accessibility of their products attracted those consumers." (Business Disability Forum, 2014: n.p.). Using these criteria ageing, obese and medical passengers will patronise the airline with the best customer service – one of the industry's product differentiators.

12. CONCLUSION

In the airline industry passengers are differentiated by what they pay. Higher prices give extended legroom, wider seats, individual service, increased luggage allowance and status recognition. However many PRMs, protected by regulation, require the benefits of higher ticket prices without paying the price. The competitive airline market has been undermined by regulations which were originally established to enable a disabled minority to participate in mainstream life. They now apply to a significant and growing minority incapacitated by ageing, obesity and medical conditions and accompanied by weighty equipment. Unlike other transport facilities and services airline PRMs cannot be mainstreamed. Each PRM has to be treated as an individual (a concept which negates the idea of 'mass transport') and with the unrecoverable, complimentary freight and other services significant numbers of PRMs could threaten airline viability.

Protective PRM regulation has had unintended consequences and is an example of inefficiently designed regulation. This matters because society, the airline industry and the PRMs have an interest in participating in a fully functioning market such as that which operates for other PRM-supply industries. An airline PRM market, just like those of other suppliers to disabled people, has to have the prospect of either a profit or government support. Furthermore making the PRM provisions accessible without proof opens them to abuse. Because PRMs are a self-determined market their numbers are possibly far greater than those described in official statistics and as the population ages, girths expand and medical tourism becomes more financially accessible, there will be more people claiming disability in order to access the services and provisions that the airline industry must supply free of charge.

Analysis using Porter's five forces has shown that offensive pursuit of the expanding PRM market is not appropriate for airlines because of the unrecoverable costs. An industry where net profit per passenger is only \$US2.56 is indeed vulnerable to fluctuations in demand and to the vagaries of inefficiently designed regulation with no provision for the increasing quantity of mobility aids, escalating fuel costs or growing numbers of immobile passengers. In the competitive transport value chain airline investors alone bear the cost of social justice for PRMs. Unaware of the mix and numbers of PRMs, airlines are pursuing a passively defensive strategy neither advertising nor destructively competing in a low-margin industry. Paradoxically, the airline offering the best PRM customer service will attract the most PRMs. It will also incur higher costs, return lower shareholder rewards and impair its ability to remain competitive.

REFERENCES

- Abeyratne, R., (2001), Ethical and moral considerations of airline management, *Journal of Air Transport Management*, 7 339-348.
- Airport Operators Association (AOA) (2009) *Airport Operators response to CAA Review of PRM Regulation Implementation*, available at: <http://www.caa.co.uk/docs/5/ergdocs/PRMAOA.pdf>.
- Bhatta, B. (2013), Pay-as-you-weigh pricing of an air ticket: economics and major issues for discussions and investigations, *Journal of Revenue and Pricing Management*, 12(2) 103-119.
- Business Disability Forum, (2014) *A market you can't ignore*, available at: <http://businessdisabilityforum.org.uk/customer-experience/the-evidence> (accessed 29 March 2014).
- Cambridge Economic Policy Associates (2010), *The extent to which airlines' interests are aligned with those of passengers*, available at: https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/3196/airline-and-passenger-interests.pdf (accessed 5 May 2014).
- Chang, Y.-C. and Chen, C.-F. (2012) Service needs of elderly air passengers, *Journal of Air Transport Management* 18 26-29.
- Civil Aviation Authority (CAA) (2010), *Accessible Air Travel*, available at: www.caa.co.uk/accessibleairtravel (accessed 10 April 2013).
- Civil Aviation Authority (CAA) (2012) *Civil Aviation Safety Notice number: SN-2012-13 – Safety Requirements Applicable to the Carriage of Electric Mobility Aids*, available at: <http://www.caa.co.uk/docs/33/SafetyNotice2012003.pdf> (accessed 27 January 2014).
- Darcy, S. (2007), Improving airline practices by understanding the experiences of people with disabilities, *TTRA Annual Conference proceedings*, available at: <http://epress.lib.uts.edu.au/research/bitstream/handle/10453/7557/2006015241.pdf?sequence=1> (accessed 17 April 2014).
- Department for Transport (2013) *Blue Badge scheme statistics: England 2012/13*, available at: https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/265878/blue-badge-scheme-statistics-2013.pdf (accessed 14 April 2014).
- Doganis, R. (2001), *The airline business in the 21st century*, Routledge, London.
- European Union (EU) (2006) *Regulation (EC) No 1107/2006 of the European Parliament and of the Council of 5 July 2006 concerning the rights of disabled persons and persons with reduced mobility when travelling by air*, Official Journal of the European Union, 26 July 2006 L204, available at: <http://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:32006R1107> (accessed 4 June 2014).

- Fleischer, A. and Pizam, A. (2002), Tourism constraints among Israeli seniors, *Annals of Tourism Research*, 29(1) 106-123.
- Gan, L. L. and Frederick, J.R., (2013), Medical Tourists: who goes and what motivates them? *Health Marketing Quarterly*, 30 (2) 177-194.
- Gatwick Airport (2009), *Response to the Civil Aviation Authority Consultation on the Implementation of the Persons with Restricted Mobility (PRM) Regulation July 2009*, available at: www.gatwickairport.com (accessed 20 July 2012).
- Hong, W.-C. (2009) Global competitiveness measurement for the tourism sector, *Current Issues in Tourism* 12 (2) 105-132.
- Hung, K.K.C., Cocks, R.A., Poon, W.K., Chan, E.Y.Y., Rainer, T.H., Graham, C.A., (2013) Medical volunteers in commercial flight medical diversions, *Aviation Space Environmental Medicine* 84.
- International Air Transport Association (2013), *Profitability and the air transport value chain, IATA economics briefing No 10*, available at: <http://www.iata.org/whatwedo/Documents/economics/profitability-and-the-air-transport-value%20chain.pdf> (accessed 1 April 2014).
- International Transport Forum (2011), *Mobility: rights obligations and equity in and (sic) ageing society: discussion paper 2011 05*, available at: <http://www.internationaltransportforum.org/jtrc/DiscussionPapers/DP201105.pdf> (accessed 21 April 2014).
- Kangis, P. and O'Reilly, M.D. (2003), Strategies in a dynamic marketplace: a case study in the airline industry *Journal of Business Research* 56 105-111.
- Lipp, E. and van Horn, L. (2007) *TIA Marketing Outlook Forum 2007 – ODO Marketing Forecast – the disability travel market, stable and growing*, available at: <http://opendoorsnfp.org/wp-content/uploads/2011/06/ODO-Marketing-Forecast-2007-stable-and-growing.pdf> (accessed 4 June 2014).
- Lipp, E. and van Horn, L. (2013), *Marketing Outlook Forum 2013 – Open Doors Organization (ODO) Forecast – The disability travel market – diverse, growing and increasingly mainstream*, available at: www.opendoorsnfp.org (accessed 17 April 2014).
- Lunt, N. T., Mannion, R. and Exworthy, M. (2013), A framework for exploring the policy implications of UK medical tourism and international patient flows, *Social Policy and Administration*, 47(1) 1-25
- Nimrod, G. and Rotem, A. (2012), An exploration of the innovation theory of successful ageing among older tourists, *Ageing and Society*, 32(3) 379-404

- Office for Disability Issues (2012) *Growing your customer base to include disabled people – a guide for businesses* available at: <http://odi.dwp.gov.uk/docs/idp/Growing-your-customer-base-to-include-disabled-people.pdf> (accessed 19 April 2014).
- Open Door Organisation (ODO), (2007) *A report on the travel behaviour of Americans with disabilities*, available at: <http://www.slideshare.net/srains/transed-2007paper> (accessed 21 April 2014).
- Oum, T. H. and Yu, Chunyan (1998) *Winning Airlines: productivity and cost competitiveness of the world's major airlines*, Kluwer Academic Publishers, Massachusetts, USA.
- Papworth Trust (2012), *Disability in the United Kingdom 2012*, available at: http://www.papworth.org.uk/downloads/disabilityintheunitedkingdom2012_120910112857.pdf (accessed 14 April 2014).
- Poria, Y., Reichel, A. and Brandt, Y. (2009) The flight experiences of people with disabilities: an exploratory study, *Journal of Travel Research* 49(2) 216-227.
- Porter, M. (1980), Industry structure and competitive strategy: keys to profitability, *Financial Analysts Journal*, 36 (4) 30-41.
- Porter, M. (2008), The five competitive forces that shape strategy, *Harvard Business Review*, January 2008.
- Shaw, S. and Thomas, C. (2006), Social and cultural dimensions of air travel demand: hyper-mobility in the UK? *Journal of Sustainable Tourism*, 14 (2) 209-215.
- Small, J. and Harris, C. (2011) *Obesity and tourism: rights and responsibilities*, *Annals of Tourism Research*, 39 (2) 686-707.
- US Department of Transportation (2006), *Follow up review: performance of US airlines in implementing selected provisions of the airline customer service commitment*, available at: <http://www.oig.dot.gov/sites/dot/files/pdfdocs/ACSfinal11-21signed.pdf> (accessed 21 April 2014).
- Van Horn, L. (2007), Disability travel in the United States: recent research and findings. *11th International Conference on Mobility and Transport for Elderly and Disabled Persons (TRANSED)* Montreal, available at: <http://www.rollinggrains.com/archives/001743.html> (accessed 12 April 2014).
- World Health Organisation (WHO) (2013), *Obesity and overweight fact sheet no 311, September*, available at: <http://www.who.int/mediacentre/factsheets/fs311/en/> (accessed 10 April 2014).